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ABSTRACT

This paper is intended as a guide for the use and development of simulation games in the classroom. To justify the use of such games at a time when the public is demanding a return to "the basics," the paper cites 30 ways in which simulations can contribute to student learning, including the following: (1) simulations help to motivate students; (2) they help students understand the relationships among economic, cultural, historical, political, social, and interpersonal factors that form the social system; (3) they permit the student to practice making real-life decisions without suffering the direct consequences of wrong decisions; (4) they place the responsibility for learning on the student, not the teacher; (5) they help develop a student's problem solving abilities; (6) they require critical thinking, not just rote memorization; (7) they bridge the gap among the various reading levels in a classroom; (8) they encourage student-to-student verbal interaction; (9) they convey cause and effect relationships; and (10) they teach the student the form and content of the model being used. The paper then provides seven steps for use by teachers who wish to create their own simulation activities. An appendix contains a list of sources for commercially produced simulation games. (FL)

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SIMULATION AND THE CURRICULUM

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Simulation and the Curriculum

The process of using simulations as a method of instruction is as old as mankind. Studies of certain lower animal groups clearly indicate that these animals simulate "wars" and "hunting." Human beings from their earliest years simulate almost every activity that contributes to the learning process. In view of this innate trend to simulate in the learning process, educators might well be advised to reflect upon the use of simulations in learning environments.

Simulations require the use of teacher-student role-playing during the operation of a comparatively complex symbolic model of an actual or hypothetical process instilled into a simulation format. Such simulation forms may be all-man, man-computer, or all-computer operations. Such simulations give a selective representation of reality, containing only those elements of reality that the simulation designer deems relevant to his purpose.[1]

In a simulation exercise the teacher becomes a "facilitator of learning" rather than a "teller of truth." The teacher moves about the classroom among the students stimulating them and answering their questions as they utilize the principles of simulations. Those four principles are listed and described below.

> FREEDOM AND GROUPING: Students experience an open environment where they are free to discuss rather than the more common exposure of a teacher authoritarian environment where he is "taught."

[1]"Simulation: What Is It? What Can It Do?" Undated, mimeographed paper by Western Behavioral Sciences Institute, p. 1.

INTERACTION THROUGH INVOLVEMENT: The student has a unique experience because the teacher did not state exactly what was to be done or exactly what was to be learned. The student was involved in three kinds of interaction: individual to indivdual; individual to group; and group to group.

DECISION-MAKING: The student no longer must make a decision to listen to the teacher, read a book or do an assignment. Rather the student makes decisions that reflect his personality and core values. The student does not view his decisions as threatening because he is in a simulated environment where he can try out decisions without permanent consequences.

COMMITMENT: Finally, the student's interaction with others in the simulated environment gives him an opportunity to act upon his beliefs. Although the student was playing a role, he probably found his values shaping how he played the role. His conservation, behaviorism, idealism or pragmatism likely surfaced and he committed himself to act in a certain manner while in the presence of his peers. As a result, the student learned more about himself, instead of seeming abstract and unrelated to his life, became a direct experience which will be remembered. Words and concepts are soon forgotten, experiences are remembered.[2]

[2]Dennie Smith, WEB: A Simulation of Working in an Educational Bureaucracy, Lakeside, California: Interact Company, 1973, p.82.

Why attempt to use simulations in the curriculum when the public is raising, once again, the issues of basic education and literacy? The writer believes there are three very basic answers to this question.

First, the American educational system was designed and still functions much like the Roman water conduits of centuries ago. Knowledge is presumed to be stored in the reservoirs of of that person termed "adult." In the educational process, that knowledge flows from the adult "teacher" to the minor "student" and produces learneds not learners. Such an educational system is not, therefore, syncronized with the concept of learning as a lifelong activity.

Second, the present methods of teaching in the American educational system make students the carriers of an obsolete culture. Such teaching methods cannot keep pace with the tremendous knowledge explosion and advances in technology. Students taught in the present system are not viable, renewing individuals and for the most part will experience difficulties in adjusting to the career changes that will be faced by most workers in the next several decades.

Third, psychology and professional experience strongly suggest that students do not learn by being taught. Rather they learn by experiencing the consequences of their actions and by coming to grips with their environment.

If, in fact, simulations are required in the educational process, what can one reasonably expect them to contribute to student learning? Cited below are some thirty observations of ways in which simulations may be helpful.

1) Simulations help to motivate students. They help to generate enthusiasm for and commitment to: (a) learning in general, (b) social studies or other curriculum areas, (c) a specific curriculum discipline, (d) a specific course, or (e) a specific teacher or teaching style.
2) Simulation experiences lead students to more sophisticated and relevant inquiry. Once the simulation is completed, students ask questions about the "model" and its application to real events and factors. Such questioning leads into a critique and analysis of the simulation and to discussions of the stress and tensions created by the "model."
3) Simulations help the students to understand the interconnectedness of those economic, cultural, historical, political, social and interpersonal factors which form the social system.
4) Students who participate in simulations learn skills such as decision-making, resource allocation, communication, persuasion, and influence-resisting. They understand the rational and emotional aspects of these skills.
5) Simulations affect attitudes in three ways: (a) students gain empathy for real life decision-makers; (b) they see life as more complicated than they imagined; (c) they realize that they can do something important about changing their personal life, the nation or the world.

6) Everyone has a personal psychology or sociology. Simulations being these personal views into reality. People know much that is stored on a sub-conscious level and simulations act as information retrieval systems to the conscious level.

7) Participants in simulation learn the form and content of the model which is used.

8) Simulations act as "change agents" for the social setting in which education takes place. The physical format of simulations creates a departure from the usual classroom set-up, produces a more natural communication exchange between teachers and pupils, and moves "control" of the classroom from the teacher to the structure of the simulation, thus improving student-teacher relationships.

9) Simulations may help the teacher to see the students as more able than originally estimated, resulting in teacher introspection to explain classroom failures.

10) Simulations cause teachers to be more critical of their usual teaching methods.

11) A simulation in one classroom can create student enthusiasm which spreads to other classrooms via informal student channels.

12) A larger range of skills can be taught through simulations than by current teaching methods.

13) Simulations more nearly approximate the natural processes through which learning occurs outside the school.

14) Simulations permit the student to practice making real life decisions without suffering the direct consequences of wrong decisions.

15) The use of simulations in social studies creates a laboratory situation similar to that used in teaching the physical sciences.

16) Simulations are student motivators.

17) In simulation, learning comes not as a result of "trying to learn," but rather as a by-product of coping with the environment. Since the success in the simulation makes the content relevant, real learning occurs.

18) Simulations place the responsibility for learning on the student, not the teacher.

19) In simulations the teacher serves as a coach, not the judge, jury and executioner.

20) Normal teaching methods create little active student involvement. Simulations require almost 100% participation and involvement by the student.

21) Simulations can successfully be utilized in classes where reading levels span five or more grade levels.

22) Normal teaching methods discourage student-to-student verbal interaction. Simulations not only encourage this interaction but, in fact, require such interaction.

23) Simulations are effective in teaching at the various skill levels noted in Bloom's Taxonomy of Educational Objectives.

24) Simulations cause circular lines of communication among students rather than the linear teacher-student model.

25) Because students must accept the consequences of early decisions, they quickly comprehend the results of alternative decisions.

26) If the participants' strategy and action are not effective, the simulation requires the participant to evaluate what is wrong and selects alternatives for improving his strategy.

27) Simulations convey the cause and effect relationships involved in a complex interactive situation.

28) Simulations are well suited for developing problem-solving abilities of students. Since there is no single "right" outcome or any one best strategy, simulations encourage a flexible approval to problems.

29) Simulations reward effective problem-solving and do not prescribe punishment for the use of conscious or intuitive means of solving the problem.

30) Simulations require the gifted student to think critically, not just memorize.[3]

If simulations are viable teaching tools, how does a teacher obtain such simulations? Essentially there are two means of obtaining simulations. The first, and probably the best for the novice, is to purchase the simulations from sources noted in Appendix A. The second method is to begin to construct

[3]"Simulation: What Is It? What Can It Do?" Undated, mimeographed paper by Western Behavioral Sciences Institute, pp.2-5.

one's own simulations. In writing simulations, the seven steps noted below should be followed.

1) Select simulation writers who have a sense of openness, expectation and invention.
2) The writers must establish clearly defined, specific goals. The goals must be both effective and cognative. The simulation can be designed as a total unit teaching tool or as a single unit culuminating lesson.
3) The third step is to consider the ages, abilities, interests and problems of the students, together with the teacher's abilities and teaching methods.
4) The fourth step requires listing the necessary data and the methods to be employed in the simulation to attain the stated goal.
5) Formulate clear, simple rules for the simulation. It is advisable to allow for flexibility and classroom decisions since students will certainly ask a question not considered by the writer.
6) Instruct the teacher in the use of the simulation.
7) Use the simulation with the students, evaluate it, then modify and enrich it for further usage.[4]

The writer hopes that these comments and suggestions will serve to encourage teachers to use simulations as a teaching tool. Their efforts may well serve as field tests to validate the assumptions stated in this article.

[4]Nancy Scott, "Gaming in the Church School," Simulation, Gaming and the Church, (November 15, 1971), p.3.

APPENDIX A

Sources of Simulation Games

Abt Associates, Inc.
55 Wheeler Street
Cambridge, Mass. 02138

The largest developed of simulation games. Most of their games are developed for other agencies under contract arrangements. Have recently started distributing some games under new department called "Games Central."

Academic Games Assoc., Inc.
430 East 33 Street
Baltimore, Maryland 21218

Most of their games have strong sociological emphasis. Most of their games are now published by Western Publishing Company, 850 Third Avenue, New York 10022.

Western Behavioral Sciences Inct.
1150 Silverado
La Julla, California 92037

Most of their games involve a strong emphasis on group dynamics and human relationships. Also publish an excellent newsletter at $5.00 per year subscription rates.

Interact
P.O. Box 262
Lakeside, California 92040

Their simulations are designed as two to four week teaching units. Developed to produce student involvement and motivate students to do personal research. Most of their games have strong historical emphasis.

Instructional Simulations, Inc.
2147 University Avenue
St. Paul, Minn. 55114

Most of their simulations deal with socio-political concepts. Publish a newsletter at $10.00 per year subscription rates.

Simulation Systems Program
Teaching Research
Monmouth, Oregon 97361

Presently developing and field testing a series of 20 simulation games to be used in American History courses. Some are now available. Games consist of teachers' manuals that present you with a sort of do-it-yourself kit. Also publish free newsletter.

Appendix A (cont.)

Environetics
1100 17th St., N.W.
Washington, D.C. 20038

Develops simulations concerned with urban environment.

Project Poila
Department of Political Science
University of California
Santa Barbara, Calif. 93106

Develops simulations concerned with political institutions.

WIT N Proof
P.O. Box 71
New Haven, Conn. 06501

They develop mostly mathematical games. However, they produce several in the social studies area.

Science Research Associates, Inc.
250 East Erie Street
Chicago, Illinois 60611

They were the first educational publishers to venture into simulation gaming with an international simulations game called Inter-Nation simulation. They are now producing simulations in several areas.

World Law Fund
11 West 42 Street
New York, NY 10036

They are concerned with developing games about disarmament and world peace.

Harder and Harder
232 Madison Avenue
New York, NY 10016

Have several simple simulations for elementary and up.

Educational Games Company
Box 363
Peekskill, NY 10566

Election game is designed to illustrate some aspects of an election system.

P. Edward Hughes
Tower Hill Summer School
2813 West 17 Street
Wilmington, Delaware 19808

Exploration and Colonization is a geography game for grade school level.